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The Effect of Analyst Coverage on the Informativeness of Income Smoothing

Abstract

This study examines whether analyst coverage affects the informativeness of income smoothing. I find that income smoothing enhances earnings informativeness more greatly for firms with high analyst coverage than for firms with low analyst coverage. The results suggest that income smoothing more efficiently communicates private information to investors when firms are followed by more analysts, consistent with the notion that analysts play an important information intermediary role in enhancing the informativeness of income smoothing.

Keywords: Analyst coverage; Income smoothing; Informativeness; Opportunism.

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1. Introduction

There are two underlying motivations for income smoothing, a unique type of earnings management (Tucker & Zarowin, 2006). First, managers may smooth earnings to efficiently communicate private information about future earnings to investors, i.e., *informativeness* of income smoothing. Tucker and Zarowin (2006) document strong evidence on the positive association between income smoothing and earnings informativeness, suggesting that income smoothing is an important way for managers to communicate private information. Second, managers may smooth earnings to intentionally distort financial performance for their opportunistic purposes, i.e., *opportunism* of income smoothing. This argument is also supported by previous studies (e.g., Healy, 1985; Watts & Zimmerman, 1990).

Analysts play an important information intermediary role in capital markets. On the one hand, analysts can search for private information and communicate private information to investors. On the other hand, analysts can interpret public information to investors. Chen, Cheng, and Lo (2009) find evidence on both analysts' private information discovery role and public information interpretation role. Analysts' information interpretation role may help investors to use information signaled by managers. Given that managers communicate private information via income smoothing, the interpretation role may reinforce the informativeness of income smoothing. Moreover, analysts' information discovery role may enhance the oversight of financial reporting. Yu (2008) finds that high analyst coverage is associated with a low level of discretionary accruals, suggesting that analyst coverage may play a monitoring role in

constraining managerial opportunism. Given that analysts' information discovery role can constrain opportunistic income smoothing, the discovery role will also enhance the informativeness of income smoothing. Taken together, both information interpretation and discovery roles suggest that analyst coverage may be positively associated with the informativeness of income smoothing.

However, the positive association between analyst coverage and the informativeness of income smoothing could be challenged by analysts' information discovery role itself. Since analysts can acquire and communicate private information, companies may have a low demand for using income smoothing to signal information when they are followed by more analysts. This may lead to a negative effect of analyst coverage on the informativeness of income smoothing. It is unclear whether the positive (negative) effect of analysts' information interpretation (discovery) role on the informativeness (opportunism) of income smoothing is offset by the negative effect of analysts' information discovery role on the informativeness of income smoothing. Thus, it is worth documenting empirical evidence on the net effect of analyst coverage on the informativeness of income smoothing.

To shed light on the relationship between analyst coverage and the underlying motive for smoothing earnings, this study examines the effect of analyst coverage on the informativeness of income smoothing. Based on analysts' information discovery and interpretation roles, I argue that analyst coverage is positively associated with the informativeness of income smoothing. However, this argument is also challenged by analysts' information discovery role. To investigate this empirical issue, I employ the

Tucker and Zarowin (2006) approach to measure the informativeness of income smoothing. Using a sample of 4,730 firm-year observations, I find that income smoothing enhances earnings informativeness more greatly for firms with high analyst coverage than for firms with low analyst coverage, consistent with the argument of the positive effect of analyst coverage on the informativeness of income smoothing. The results hold after controlling for the endogeneity of analyst coverage. These findings suggest that income smoothing more efficiently communicates private information to investors when firms are followed by more analysts, consistent with the notion that analysts play an important intermediary role in enhancing the informativeness of income smoothing.

Ayers and Freeman (2003) find that analyst coverage positively affects the association between stock returns and future earnings. Their results suggest that high analyst coverage may lead to high credibility of accounting numbers as the association between stock returns and future earnings may reflect the credibility of accounting earnings. Unlike Ayers and Freeman (2003), this study examines the effect of analyst coverage on the association between stock returns and the interaction of income smoothing and future earnings. Since the association between stock returns and the interaction of income smoothing and future earnings measures the extent to which income smoothing can signal private information about future earnings (Tucker & Zarowin, 2006), this study's results more directly reflect the effect of analyst coverage on the informativeness or "credibility" of income smoothing rather than the credibility of accounting numbers.

This study contributes to the literature in the following two ways. First, this study extends the research on analysts' information intermediary role by examining the effect of analyst coverage on the informativeness of income smoothing. Analysts' interpretation role may strengthen the signaling function of income smoothing, while their information discovery role may constrain opportunistic income smoothing and thus enhance the informativeness of income smoothing. However, analysts' information discovery role may reduce companies' demand for communicating private information via income smoothing and then weaken the informativeness of income smoothing. Hence, it is warranted to make clear whether analyst coverage positively affects the informativeness of income smoothing. This study provides empirical evidence that analysts' intermediary role leads to more efficient income smoothing. Second, this study also adds to the literature on the informativeness of earnings management by focusing on analyst coverage. Prior research (e.g., Subramanyam, 1996; Tucker & Zarowin, 2006) mainly examines whether earnings management is informative about future earnings. To the best of my knowledge, this is the first study to investigate whether analyst coverage affects the informativeness of income smoothing. This study suggests that the informativeness of income smoothing is affected by firms' information environment or corporate governance.

The remainder of the paper is organized as follows. Section 2 introduces background and develops the hypothesis. Section 3 discusses research design. Section 4 presents empirical results. Section 5 concludes.

2. Background and hypothesis

2.1. Informativeness and opportunism of income smoothing

Like other types of earnings management, income smoothing can be classified by two different managerial motivations: (1) “informative” income smoothing, and (2) “opportunistic” income smoothing. Informative income smoothing means that managers have incentives to smooth earnings to communicate private information about future earnings to investors. If income smoothing is informative, information about future earnings can be reflected in smoothed current earnings and thereafter stock prices. Sankar and Subramanyam (2001) theoretically investigate the managerial motivation for income smoothing by showing that managers use income smoothing as a vehicle to communicate their private information about future earnings. Subramanyam (1996) finds that discretionary accruals are positively associated with stock returns, future earnings, and operating cash flows, suggesting that discretionary accruals may communicate information about future benefits. Hunt, Moyer, and Shevlin (2000) use the contemporaneous price-earnings relation to measure earnings informativeness and document that the price-earnings relation is positively associated with income smoothing. These studies support the notion that income smoothing can enhance earnings informativeness.

Recently, Tucker and Zarowin (2006) refine the measurement of earnings informativeness by using the association between current-year stock returns and future earnings, i.e., future earnings response coefficient. They justify this proxy for earnings informativeness by arguing that all information communicated via income smoothing can

be impounded in current stock prices, but some of which cannot be captured by current earnings. Using this measurement, they document strong evidence that earnings informativeness is positively associated with the extent to which firms smooth earnings. This suggests that income smoothing plays an informative role in communicating private information about future earnings.

As opposed to informative income smoothing, opportunistic income smoothing means that managers are motivated to smooth earnings not for the efficient communication of their private information but for their private purposes (Watts & Zimmerman, 1990; Healy & Wahlen, 1999). If income smoothing is opportunistic, smoothed earnings are more likely to be garbled and thus become less informative about future earnings. Healy (1985) and Holthausen, Larcker, and Sloan (1995) investigate the relationship between managerial reporting behavior and bonus schemes. They find that managers use accruals to defer income for firms with caps on bonus awards when that cap is reached, suggesting that managers use accounting discretion to increase their bonus awards. Prior research (e.g., DeAngelo, 1988; Dechow & Sloan, 1991; Fudenberg & Tirole, 1995) also suggests that managers manipulate earnings when job security is threatened or their expected tenure with the firm is short. These studies are consistent with the argument that income smoothing is opportunistic. In summary, income smoothing may bring about not only benefits (informativeness) but also costs (opportunism).

2.2. *Information intermediary role of analysts*

Analysts play an information intermediary role by producing information to explore or supplement financial reporting (Healy & Palepu, 2001). One aspect of analysts' information intermediary role is to search for private information and communicate it to investors by issuing forecasts, ratings, and research reports. Another aspect of analysts' information intermediary role is to interpret public information to investors. There is a large body of research that examines the information intermediary role of analysts. For example, Givoly and Lakonishok (1979) and Lys and Sohn (1990) document evidence on the market reaction to the release of analyst reports, suggesting that analyst coverage is informative. Hong, Lim, and Stein (2000) find a negative association between analyst coverage and the profitability of momentum strategies. Thus, information about firms with high analyst coverage is more likely to be available to the investing public.

Barth, Kasznik, and McNichols (2001) investigate the relation between analyst coverage and intangible assets. They find that analyst coverage is greater for firms with more intangible assets, suggesting that analysts have incentives to acquire private information when there is more information asymmetry between managers and investors, or more inherent uncertainty about firm value. Ayers and Freeman (2003) examine whether analyst following affects the pricing of future earnings, and find that prices of firms with high analyst coverage incorporate future earnings earlier than prices of firms with low analyst coverage. Using insider trading profits as a proxy for the information asymmetry between managers and outside investors, Frankel and Li (2004) find that

analyst following is negatively associated with insider trading profits. Chen, Cheng, and Lo (2009) find that an accurate analyst earnings forecast can pre-empt the information content of a quarterly earnings announcement, while an informative earnings announcement with precise forward looking information can pre-empt information in subsequent analyst reports. Their results suggest that analyst coverage plays not only an information discovery role but also an information interpretation role.¹

Lang and Lundholm (1993) find that analyst coverage increases in corporate disclosure, suggesting that managerial disclosure may positively affect analyst coverage. However, Healy and Palepu (2001) argue that “the effect of voluntary disclosure on demand for analysts’ services is ambiguous” because “public voluntary disclosure also pre-empts analysts’ ability to distribute managers’ private information to investors, leading to a decline in demand for their services” (Healy & Palepu 2001, pp. 417). Moreover, Lang and Lundholm (1993) focus on the effect of voluntary disclosure on analyst coverage rather than the effect of analyst coverage on voluntary disclosure. There is rare research that examines the effect of analyst coverage on voluntary disclosure. This study implicitly addresses this unclear issue. Analysts’ information interpretation role may increase managers’ incentive to disclose private information as the disclosed information can be effectively communicated to investors via analysts, while analysts’ information discovery role may reduce managers’ demand for disclosing private information because analysts might have acquired that information.

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¹ Previous studies also suggest that there are some behavior biases in analysts’ production of information (e.g., Lin & McNichols, 1998; Hong, Kubik, & Solomon, 2000; Clarke & Subramanian, 2006; Bernhardt, Campello, & Kutsoati, 2006).

Analysts' information intermediary role may have governance aspect. Analysts' information discovery role suggests that they have incentives to acquire private information and scrutinize firms' public disclosure to secure their good job performance, thereby playing an important role in monitoring firms' financial reporting. Analysts have great experience on tracking corporate financial statements and substantial industry-wide knowledge, which can help them effectively monitor financial reporting process, e.g., by interacting directly with management and raising questions through earnings release conferences. Dyck, Morse, and Zingales (2008) find that analysts are more effective in the discovery of corporate fraud than the Securities and Exchange Commission and auditors are, suggesting that analyst coverage is an important alternative governance mechanism. Analyst coverage can act as a magnifying lens of managerial opportunism, which allows less informed shareholders and outside directors to impose discipline on value destroying managers. Thus, analyst following may increase firms' overall governance quality. Recently, Yu (2008) and Knyazeva (2007) find that earnings management is lower for firms with high analyst coverage than for firm with low analyst coverage, suggesting that analyst coverage may constrain managerial opportunism.

2.3. *Hypothesis*

Analysts can interpret public information to investors because they possess superior information processing abilities. Analysts have better knowledge and experience on companies and industries so that they can help investors to understand the private information communicated via income smoothing. Chen, Cheng, and Lo (2009) argue that analysts often discuss the effect of changes in accounting methods, the effect of

nonrecurring charges, and the implication of changes in corporate strategy for future performance in many of their reports. Therefore, analysts' interpretation role can facilitate investors to use information disclosed in earnings announcements and financial reports. When managers communicate private information via income smoothing, analysts will interpret that information to investors. Ayers and Freeman (2003) suggest that stock prices of companies with more analyst coverage may incorporate more information from analysts. Thus, more private information communicated via income smoothing will be incorporated in stock prices when firms are followed by more analysts, given that income smoothing is informative.

Moreover, analysts' information discovery may serve a monitoring role in financial reporting. For firms with high analyst coverage, managers are more likely to be questioned for their opportunistic behavior when analysts have truthful information, and will be more difficult to engage in opportunistic income smoothing. Strong governance resulting from high analyst coverage may lead to less managerial opportunism and more oversight of financial reporting (Lang, Raedy, & Wilson, 2006; Yu, 2008; Knyazeva, 2007). The governance role of analyst coverage curtails managerial opportunism and thus enlarges the informative role of accounting discretion. Thus, I argue that analyst coverage may be positively associated with the informativeness of income smoothing given that analysts' information discovery role can enhance the oversight of financial reporting and thus reduce opportunistic income smoothing. Based on the above arguments of the positive (negative) effect of analysts' information discovery

(interpretation) role on the informative (opportunistic) part of income smoothing, I develop the hypothesis as follows:

H1. Analyst coverage is associated with the informativeness of income smoothing.

However, the hypothesis is also challenged by analysts' information discovery role. Since analysts can search for and communicate private information to investors, much "private" information about future earnings has become "public" when firms are followed by more analysts. Even though the signaling costs through accounting discretion are not high and managers always have incentives to signal private information, firms with high analyst coverage may have less private information to signal via income smoothing than firms with low analyst coverage. The proportion of informative income smoothing may be lower for firms with high analyst coverage than for firms with low analyst coverage. Thus, analysts' information discovery role may reduce companies' demand for communicating private information via income smoothing. It is warranted to document empirical evidence on the net effect of analyst coverage on the informativeness of income smoothing.

3. Research design

3.1. Sample selection

The sample selection begins with the data from the 2006 version of Compustat's industrial annual data file and the IRRC database.² I identify 1996-2002 as the sample period for testing the hypothesis. I choose 1996 as the first year of the period because the data of directors are not available for years before 1996 in this version of the IRRC

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² The IRRC database provides the data of directors.

database. The sample period ends in 2002 because I use the future three years' earnings and stock returns to implement the Collins, Kothari, Shanken, and Sloan (1994) approach for gauging earnings informativeness. To compute discretionary accruals, I exclude all observations from a two-digit SIC industry that contains less than eight observations. I also delete observations from the financial and regulated industries (SIC 4000-4999 and 6000-6999) and observations with missing data. Then, the data set is merged with the I/B/E/S detail file from which analyst coverage is computed. After excluding observations with missing data from the CRSP database, the final sample consists of 4,730 firm-year observations over the period 1996 to 2002. Table 1 reports the breakdown of the sample by industry. The sample firms distribute across 38 two-digit SIC industries, of which electrical and electronic equipment (10.70%), chemicals and allied products (10.27%), business services (9.26%), industrial machinery and equipment (8.69%), and instruments and related products (6.07%) are the most widely represented industries in the sample.

TABLE 1 ABOUT HERE

3.2. Measurement of income smoothing

To compute discretionary accruals, I first estimate the following cross-sectional variant of the modified Jones model using observations within each two-digit SIC industry-year:

$$ACC/TA_{-1} = a_0 1/TA_{-1} + a_1 \Delta SALES/TA_{-1} + a_2 PPE/TA_{-1} + a_3 ROA + \varepsilon \quad (1)$$

where

ACC = total accruals measured as the difference between earnings before

extraordinary items and discontinued operations and cash flow from operations,

TA_{-1} = total assets at the beginning of the year,

$\Delta SALES$ = change in sales between year $t-1$ and year t ,

PPE = gross property, plant, and equipment,

ROA = return on assets.

After estimating parameters in model (1), I measure the discretionary accruals as the residual values of the regression. The pre-discretionary income is measured as net income minus discretionary accruals. Second, I compute the correlation between change in discretionary accruals and change in pre-discretionary income using the current year and past four years' observations. This correlation coefficient reflects income smoothing as a negative correlation indicates that managers use discretionary accruals to make the reported series of earnings smooth (Myers, Myers, & Skinner, 2007; Leuz, Nanda, & Wysocki, 2003). Like Tucker and Zarowin (2006), income smoothing (IS) is measured as a firm's reversed fractional ranking of the correlation coefficient within its two-digit SIC industry-year.

3.3. *Earnings informativeness and informative role of income smoothing*

Tucker and Zarowin (2006) investigate whether income smoothing improves earnings informativeness using the benchmark model of earnings informativeness originated from the model that Collins et al. (1994) employ to examine how much

information about future earnings is reflected in current stock returns.³ Based on Tucker and Zarowin (2006), I measure earnings informativeness using the following panel regression model:⁴

$$R_t = b_0 + b_1X_{t-1} + b_2X_t + b_3X_{t3} + b_4R_{t3} + b_5BETA_t + \varepsilon_t \quad (2)$$

where

R_t = the ex-dividend stock return in year t ,

X_{t-1} = the split-adjusted earnings per share before extraordinary items in year $t-1$,
deflated by the stock price at the beginning of year t ,

X_t = the split-adjusted earnings per share before extraordinary items in year t ,
deflated by the stock price at the beginning of year t ,

X_{t3} = the sum of split-adjusted earnings per share before extraordinary items in
years $t+1$, $t+2$, and $t+3$, deflated by the stock price at the beginning of year t ,

R_{t3} = the annually compounded stock return for years $t+1$ through $t+3$.

$BETA_t$ = the slope coefficient of a regression of monthly stock returns on equally
weighted market returns in year t .

I include $BETA_t$ in the model to control for the effect of market risk on stock returns. In model (2), the coefficient on X_{t3} measures the extent to which the information about future earnings is reflected in current stock price. A higher coefficient on X_{t3} indicates higher earnings informativeness.

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³ I focus on Tucker and Zarowin's (2006) approach because they argue that this approach is superior.

⁴ The panel regression model is a two-way (firm and year) fixed effect model, which controls for serial correlation. For comparison, I also provide the results of the main test without having regression with fixed effects in the appendix.

Like Tucker and Zarowin (2006), I expand model (2) by including IS and the interactions between IS and earnings and stock returns variables:

$$R_t = b_0 + b_1 X_{t-1} + b_2 X_t + b_3 X_{t3} + b_4 R_{t3} + b_5 BETA_t + b_6 IS_t + b_7 IS_t * X_{t-1} + b_8 IS_t * X_t + b_9 IS_t * X_{t3} + b_{10} IS_t * R_{t3} + \varepsilon_t \quad (3)$$

where IS_t is income smoothing.

In the panel regression model (3), the efficient on $IS_t * X_{t3}$ reflects the informativeness of income smoothing, i.e., the extent to which income smoothing enhances earnings informativeness (Tucker and Zarowin, 2006). A significant and positive coefficient on $IS_t * X_{t3}$ will suggest a significant improvement in earnings informativeness through income smoothing.

3.4. Hypothesis testing

I run the panel regression to test the hypothesis. Model (3) is expanded by including analyst coverage, its interactions with X_{t3} and $IS_t * X_{t3}$, and several control variables:⁵

$$R_t = b_0 + b_1 X_{t-1} + b_2 X_t + b_3 X_{t3} + b_4 R_{t3} + b_5 BETA_t + b_6 IS_t + b_7 IS_t * X_{t-1} + b_8 IS_t * X_t + b_9 IS_t * X_{t3} + b_{10} IS_t * R_{t3} + b_{11} ANALYST_t + b_{12} ANALYST_t * IS_t + b_{13} ANALYST_t * X_{t3} + b_{14} ANALYST_t * IS_t * X_{t3} + b_{15} BDIND_t + b_{16} BDIND_t * IS_t + b_{17} BDIND_t * X_{t3} + b_{18} BDIND_t * IS_t * X_{t3} + b_{19} SIZE_t + b_{20} SIZE_t * X_{t3} + b_{21} BM_t + b_{22} BM_t * X_{t3} + b_{23} EARNSTD_t + b_{24} EARNSTD_t * X_{t3} + b_{25} LOSS_t + b_{26} LOSS_t * X_{t3} + \varepsilon_t \quad (4)$$

where

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⁵ The continuous variables in the models are winsorized at 1% and 99%.

$ANALYST_t$ = analyst coverage, measured as the number of analysts who issued earnings forecasts (Yu, 2008),

$BDIND_t$ = board independence, measured as the proportion of independent directors on the board,

$SIZE_t$ = firm size, measured as the market value of common equity,

BM_t = book-to-market ratio, measured as the ratio of book value of common equity to market value of common equity,

$EARNSTD_t$ = future earnings variability, measured as the standard deviation of earnings per share adjusted for stock splits and stock dividends for years $t+1$ to $t+3$, deflated by the stock price at the beginning of year t ,

$LOSS_t$ = dummy variable, coded “1” if a firm is making loss and “0” otherwise.

In model (4), the coefficient on the three-way interaction term, i.e., $ANALYST_t * IS_t * X_{t3}$, will be positive and significant if the argument of the positive effect of analyst coverage on the informativeness of income smoothing is supported, but will be negative and significant if the argument of the negative effect of analyst coverage on the informativeness of income smoothing is supported. Klein (2002) and Vafeas (2005) suggest that independent directors are more effective in constraining opportunistic earnings management. Thus, we include board independence and its interaction with $IS_t * X_{t3}$ in the model to control for the effect of board independence on the informativeness of income smoothing. I expect a positive coefficient on $BDIND_t * IS_t * X_{t3}$. In model (4), I also include firm size, the book-to-market ratio, future earnings variability, and loss-making indicator, and their interactions with X_{t3} because Tucker and Zarowin (2006) find

that those factors are associated with earnings informativeness. Based on Tucker and Zarowin (2006), the coefficients are expected to be positive for $SIZE_t * X_{t3}$ and $BM_t * X_{t3}$, and be negative for $EARNSTD_t * X_{t3}$ and $LOSS_t * X_{t3}$.

In addition, I test the hypothesis by allowing for the endogenous relationship between analyst coverage and earnings quality. Analysts may be more likely to cover firms with high earnings quality (Yu, 2008). Thus, it is likely that analyst coverage is affected by earnings quality, which also affects the informativeness of income smoothing. I use the past four years' average analyst coverage as an instrumental variable because income smoothing is a multi-year activity and the monitoring of analysts may come from an average level of analyst coverage during these years. To address this concern, I run the two-stage panel regression. I estimate the first stage model as follows:

$$ANALYST_t = a_0 + a_1 PAST_t + a_2 SIZE_t + a_3 ROA_{t-1} + a_4 GROWTH_t + a_5 EXTFIN_t + \varepsilon_t \quad (5)$$

where

$PAST_t$ = past four years' average analyst coverage,

ROA_{t-1} = lagged return on assets,

$GROWTH_t$ = growth rate of assets, measured as the change in total assets deflated by the beginning-of-year total assets,

$EXTFIN_t$ = external financing, measured as net cash proceeds from equity and debt financing deflated by total assets.

Firm size, past earnings performance, growth, and external financing are included in model (5) because those firm characteristics may affect analyst coverage (Yu, 2008).⁶ I run the second stage regression model, i.e., model (4), using the fitted value ($ANALYST_{t-1}F$) from model (5) to replace $ANALYST_t$ in model (4).

4. Empirical results

Table 2 tabulates the descriptive statistics of the 4,730 sample observations. The first six rows list the variables used in implementing the model to measure earnings informativeness. The other rows contain the additional variables used in testing the hypothesis. The mean and median of analyst coverage are 12.48 and 10.00, respectively, while the mean and median of board independence are 61.3% and 62.5%.

TABLE 2 ABOUT HERE

Table 3 reports the Pearson correlations between the independent variables used in model (4). The current earnings per share is negatively correlated with the loss-making dummy ($r = -0.67$).⁷ The maximum absolute value among the other correlation coefficients is 0.47 between X_t and X_{t-1} . Overall, the correlations among the independent variables are not extremely high. Thus, it is less likely that multicollinearity is a substantive issue in this study.

TABLE 3 ABOUT HERE

Table 4 presents the results on earnings informativeness and the informative role

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⁶ Yu (2008) also includes cash flow volatility in his model, but finds no significant coefficient on this variable. The results are not qualitatively changed if cash flow volatility is also included in model (5) of this study.

⁷ I find similar results if $LOSS_t$ is excluded from the models to eliminate the possible multicollinearity resulted from the high correlation between $LOSS_t$ and X_t .

of income smoothing. In Table 4, columns 3 and 4, I document that current stock returns are positively associated with current earnings and aggregate three years ahead earnings (t -statistic = 15.43 and 11.51, respectively), and negatively associated with lagged earnings and cumulative three years ahead stock returns (t -statistic = -9.91 and -7.57). I also find that stock returns are positively associated with market risk. Table 4, columns 5 and 6 show that the coefficient on $IS_t * X_{t3}$ is positive and significant (t -statistic = 2.99), consistent with Tucker and Zarowin (2006). The results suggest that income smoothing plays an important role in enhancing earnings informativeness.

TABLE 4 ABOUT HERE

Table 5 reports the results on testing the hypothesis. I find a positive and significant coefficient on the three-way interaction term, i.e., $ANALYST_t * IS_t * X_{t3}$ (t -statistic = 2.35), consistent with the argument of the positive effect of analyst coverage on the informativeness of income smoothing. Thus, income smoothing enhances earnings informativeness more greatly for firms with high analyst coverage than for firms with low analyst coverage. This also suggests that analyst coverage serves an intermediary role in improving information interpretation and a corporate governance role in reducing accounting manipulation. In addition, I find that earnings informativeness is lower for firms with high book-to-market ratio, high future earnings variability, and negative earnings.

TABLE 5 ABOUT HERE

A concern with the results in Table 5 is that the potential endogeneity of analyst coverage is not allowed for. Analysts may be more likely to self-select firms in which

accounting discretion is more informative about future earnings. I use the two-stage panel regression to deal with the endogeneity of analyst coverage. Table 6 provides the results on examining the effect of analyst coverage on the informative role of income smoothing after allowing for the endogeneity of analyst coverage. I also find that the coefficient on $ANALYST_{t,F} * IS_t * X_{t3}$ is positive and significant (t -statistic = 2.47). Thus, the results after considering the endogeneity still support the argument that income smoothing enhances earnings informativeness more greatly for firms with high analyst coverage than for firms with low analyst coverage.

TABLE 6 ABOUT HERE

5. Conclusion

This study examines the effect of analyst coverage on the informativeness of income smoothing. I find that income smoothing enhances earnings informativeness more greatly for firms with high analyst coverage than for firms with low analyst coverage. This study shows that analyst coverage affects the motivation for income smoothing. My findings suggest that analyst coverage plays an important information intermediary role in enhancing the informativeness of income smoothing.

This study makes two contributions to the literature. First, this study extends the research on analysts' information discovery and interpretation roles. I provide empirical evidence on the positive impact of analyst coverage on the extent to which income smoothing communicates private information. Thus, this study can strengthen the argument of the positive (negative) effect of analysts' information interpretation (discovery) role on the informativeness (opportunism) of income smoothing. Second,

this study also adds to the research on the informativeness of earnings management (e.g., Subramanyam, 1996; Tucker & Zarowin, 2006). Unlike prior research, I focus on the effect of analyst coverage on the informativeness of income smoothing. This study implies that better information environment and corporate governance may lead to more informative earnings management.

This study also has its own limitations. First, I use a variant of Jones model to measure discretionary accruals. Although the Jones model is frequently used in the literature to compute discretionary accruals, it is likely that there are measurement errors in calculating discretionary accruals. Second, allowing for the endogeneity of analyst coverage is also a concern on this study. I use the past years' analyst coverage as the instrumental variable to deal with the endogeneity of analyst coverage. However, Larcker and Rusticus (2008) suggest that instrumental variable estimation may lead to loss in precision which may outweigh its benefit. Third, the empirical analysis is based on the market efficiency assumption that information about future earnings is fully reflected in stock prices. Like Tucker and Zarowin (2006), the results would be misinterpreted if stock prices are mispriced.

References

- Abbott, L. J., Parker, S., & Peters, G. F. (2004). Audit committee characteristics and restatements. *Auditing: A Journal of Practice & Theory* 23, 69-87.
- Ayers, B. C., & Freeman, R. N. (2003). Evidence that analyst following and institutional ownership accelerate the pricing of future earnings. *Review of Accounting Studies* 8, 47-67.
- Barth, M. E., Kasznik, R., & McNichols, M. F. (2001). Analyst coverage and intangible assets. *Journal of Accounting Research* 39, 1-34.
- Beasley, M. S. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review* 71, 443-465.
- Bernhardt, D., Campello, M., & Kutsoati, E. (2006). Who herds? *Journal of Financial Economics* 90, 657-675.
- Bushee, B. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73, 305-333.
- Clarke, J., & Subramanian, A. (2006). Dynamic forecasting behavior by analysts: theory and evidence. *Journal of Financial Economics* 80, 81-113.
- Collins, D., Kothari, S. P., Shanken, J., & Sloan, R. (1994). Lack of timeliness and noise as explanations for the low contemporaneous returns-earnings association. *Journal of Accounting and Economics* 18, 289-324.
- DeAngelo, L. E. (1988). Managerial competition, information costs, and corporate governance: The use of accounting performance measures in proxy contests. *Journal of Accounting and Economics* 10, 3-36.
- Dechow, P., & Sloan, R. (1991). Executive incentives and the horizon problem: An empirical investigation. *Journal of Accounting and Economics* 14, 51-89.
- Dyck, A., Morse, A., & Zingales, L. (2008). Who blows the whistle on corporate fraud? Working paper. University of Chicago.
- Frankel, R., & X. Li, X. (2004). Characteristics of a firm's information environment and the information asymmetry between insiders and outsiders. *Journal of Accounting and Economics* 37, 229-259.
- Fudenberg, D., & Tirole, J. (1995). A theory of income and dividend smoothing based on incumbency rents. *Journal of Political Economy* 103, 75-93.
- Givoly, D., & Lakonishok, J. (1979). The information content of financial analysts' forecasts of earnings: some evidence on semi-strong inefficiency. *Journal of Accounting and Economics* 1, 165-185.
- Healy, P. (1985). The effect of bonus schemes on accounting policies. *Journal of Accounting and Economics* 7, 85-107.
- Healy, P., & Palepu, K. (2001). Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature. *Journal of Accounting and Economics* 31, 405-440.
- Healy, P., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13, 365-383.
- Holthausen, R., Larcker, D., & Sloan, R. (1995). Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19, 29-74.

- Hong, H., Kubik, J., & Solomon, A. (2000). Security analysts' career concerns and herding of earnings forecasts. *Rand Journal of Economics* 31, 121-144.
- Hong, H., Lim, T., & Stein, J. (2000). Bad news travels slowly: size, analyst coverage, and the profitability of momentum strategies. *Journal of Finance* 55, 265-295.
- Hunt, A., Moyer, S., & Shevlin, T. (2000). Earnings volatility, earnings management, and equity value. Working paper, University of Washington.
- Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33, 375-400.
- Knyazeva, D. (2007) Corporate governance, analyst following, and firm behaviour. Working paper. New York University.
- Lang, M., & Lundholm, R. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review* 71, 467-492.
- Lang, M., Raedy, J., & Wilson, W. (2006). Earnings management and cross-listing: Are reconciled earnings comparable to U.S. earnings? *Journal of Accounting and Economics* 42, 255-284.
- Larcker, D., & Rusticus, T. (2008). On the use of instrumental variables in accounting research. Working paper, Stanford University.
- Leuz, C., Nanda, D., & Wysocki, P. 2003. Earnings management and institutional factors: an international comparison. *Journal of Financial Economics* 69, 505-527.
- Lin, H., & McNichols, M. F. (1998). Underwriting relationships, analysts' earnings forecasts, and investment recommendations. *Journal of Accounting and Economics* 25, 101-127.
- Lys, T., & Sohn, S. (1990). The association between revisions of financial analysts' earnings forecasts and security-price changes. *Journal of Accounting and Economics* 13, 341-363.
- Myers, J., Myers, L., & Skinner, D. (2007). Earnings momentum and earnings management. *Journal of Accounting, Auditing & Finance* 22, 249-284.
- Sankar, M., & Subramanyam, K. R. (2001). Reporting discretion and private information communication through earnings. *Journal of Accounting Research* 39, 367-392.
- Subramanyam, K. R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics* 22, 249-281.
- Tucker, J. W., & Zarowin, P. A. (2006). Does income smoothing improve earnings informativeness? *The Accounting Review* 81, 251-270.
- Watts, R., & Zimmerman, J. (1990). Positive accounting theory: A ten-year perspective. *The Accounting Review* 65, 131-156.
- Yu, F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics* 88, 245-271.

Table 1
Sample breakdown by industry

Two-Digit SIC Codes	Industry Description	Frequency	Percent (%)
13	Oil and gas extraction	186	3.93
20	Food products	181	3.83
26	Paper and allied products	117	2.47
27	Printing and publishing	173	3.66
28	Chemicals and allied products	486	10.27
33	Primary metal	139	2.94
34	Fabricated metal products	113	2.39
35	Industrial machinery and equipment	411	8.69
36	Electrical and electronic equipment	506	10.70
37	Transportation equipment	244	5.16
38	Instruments and related products	287	6.07
50	Durable goods	150	3.17
56	Apparel and accessory stores	111	2.35
58	Eating and drinking places	101	2.14
59	Miscellaneous retail	119	2.52
73	Business services	438	9.26
Others		968	20.44
Total	38 industries	4,730	100

Table 2
Descriptive statistics

Variable	N	Mean	Median	Std	Q1	Q3
R_t	4,730	0.125	0.046	0.555	-0.208	0.332
X_{t-1}	4,730	0.032	0.045	0.098	0.024	0.067
X_t	4,730	0.036	0.047	0.088	0.022	0.071
X_{t3}	4,730	0.147	0.152	0.250	0.053	0.249
R_{t3}	4,730	0.463	0.262	1.053	-0.143	0.768
$BETA_t$	4,730	0.788	0.685	0.910	0.237	1.224
IS_t	4,730	0.578	0.610	0.276	0.354	0.816
$ANALYST_t$	4,730	12.480	10.000	9.296	5.000	17.000
$BDIND_t$	4,730	0.613	0.625	0.185	0.500	0.750
$SIZE_t$	4,730	5,590.650	1,297.840	12,775.000	528.288	4,099.390
BM_t	4,730	0.656	0.339	0.960	0.169	0.720
$EARNSTD_t$	4,730	1.843	0.302	50.759	0.147	0.664
$LOSS_t$	4,730	0.154	0.000	0.361	0.000	0.000

- R_t = the ex-dividend stock return in year t ,
 X_{t-1} = the split-adjusted earnings per share before extraordinary items in year $t-1$, deflated by the stock price at the beginning of year t ,
 X_t = the split-adjusted earnings per share before extraordinary items in year t , deflated by the stock price at the beginning of year t ,
 X_{t3} = the sum of split-adjusted earnings per share before extraordinary items in years $t+1$, $t+2$, and $t+3$, deflated by the stock price at the beginning of year t ,
 R_{t3} = the annually compounded stock return for years $t+1$ through $t+3$,
 $BETA_t$ = the slope coefficient of a regression of monthly stock returns on equally weighted market returns in year t ,
 IS_t = income smoothing,
 $ANALYST_t$ = analyst coverage, measured as the number of analysts who issued earnings forecasts,
 $BDIND_t$ = board independence, measured as the proportion of independent directors on the board,
 $SIZE_t$ = firm size, measured as the market value of common equity (U.S. \$ in millions),
 BM_t = book-to-market ratio, measured as the ratio of book value of common equity to market value of common equity,
 $EARNSTD_t$ = future earnings variability, measured as the standard deviation of earnings per share adjusted for stock splits and stock dividends for years $t+1$ to $t+3$, deflated by the stock price at the beginning of year t ,
 $LOSS_t$ = dummy variable, coded "1" if a firm is making loss and "0" otherwise.

Table 3
 Pearson correlations
 (n=4,730)

Variable	X_t	X_{t3}	R_{t3}	$BETA_t$	IS_t	$ANALYST_t$	$BDIND_t$	$SIZE_t$	BM_t	$EARNSTD_t$	$LOSS_t$
X_{t-1}	0.47***	0.19***	-0.06***	-0.21***	0.19***	-0.01	-0.02	0.01	-0.06***	-0.06***	-0.30***
X_t		0.36***	-0.10***	-0.25***	0.17***	-0.04**	-0.05***	0.01	-0.13***	-0.09***	-0.67***
X_{t3}			0.13***	-0.18***	0.11***	-0.02	-0.07***	-0.03**	0.01	-0.33***	-0.31***
R_{t3}				0.00	-0.03*	-0.06***	-0.01	-0.09***	0.15***	-0.05***	0.11***
$BETA_t$					-0.12***	0.03**	-0.02	-0.09***	0.00	0.09***	0.28***
IS_t						-0.02	-0.02	0.02	-0.01	-0.07***	-0.19***
$ANALYST_t$							0.11***	0.58***	-0.34***	0.01	-0.03**
$BDIND_t$								0.11***	-0.04**	0.05***	0.03**
$SIZE_t$									-0.28***	-0.03**	-0.06***
BM_t										0.13***	0.19***
$EARNSTD_t$											0.15***

***, ** and * denote significance at 1%, 5%, and 10% levels, respectively (two-tailed tests).

Table 4
Earnings informativeness and the informative role of income smoothing

Variable	Predicted sign	Coefficient	<i>t</i> -statistic	Coefficient	<i>t</i> -statistic
Intercept	?	-0.579	-1.90**	-0.593	-1.94**
X_{t-1}	-	-0.998	-9.91***	-0.597	-3.66***
X_t	+	1.882	15.43***	1.330	6.04***
X_{t3}	+	0.578	11.51***	0.308	3.00***
R_{t3}	-	-0.071	-7.57***	-0.076	-4.18***
$BETA_t$	+	0.023	1.93**	0.021	1.83**
IS_t	?			-0.053	-0.94
$IS_t * X_{t-1}$	?			-1.367	-3.41***
$IS_t * X_t$	?			1.562	3.34***
$IS_t * X_{t3}$	+			0.504	2.99***
$IS_t * R_{t3}$	?			0.009	0.30
N			4,730		4,730
# of Cross Sections			939		939
Adj R ²			29.36%		29.89%

The panel regression model is model (2) for columns 3 and 4, and model (3) for columns 5 and 6.
*** and ** denote significance at 1% and 5% levels, respectively (one-tailed tests).

Table 5
Effect of analyst coverage on the informative role of income smoothing

Variable	Predicted sign	Coefficient	t-statistic
Intercept	?	-1.433	-4.99***
X_{t-1}	-	-0.536	-3.65***
X_t	+	1.435	6.80***
X_{t3}	+	0.854	3.10***
R_{t3}	-	-0.070	-4.34***
$BETA_t$	+	0.020	1.95**
IS_t	?	0.002	0.02
$IS_t * X_{t-1}$	?	-0.515	-1.43*
$IS_t * X_t$	?	1.507	3.60***
$IS_t * X_{t3}$	?	-0.067	-0.15
$IS_t * R_{t3}$	?	-0.051	-1.82**
$ANALYST_t$	?	-0.010	-2.97***
$ANALYST_t * IS_t$	?	0.001	0.34
$ANALYST_t * X_{t3}$	?	-0.031	-3.15***
$ANALYST_t * IS_t * X_{t3}$	+	0.037	2.35***
$BDIND_t$	?	-0.032	-0.21
$BDIND_t * IS_t$	?	0.001	0.01
$BDIND_t * X_{t3}$	?	0.231	0.58
$BDIND_t * IS_t * X_{t3}$	+	-0.458	-0.67
$SIZE_t$	?	-0.000	-9.25***
$SIZE_t * X_{t3}$	+	-0.000	-0.03
BM_t	?	0.988	23.89***
$BM_t * X_{t3}$	+	-0.147	-1.99**
$EARNSTD_t$	?	0.051	3.87***
$EARNSTD_t * X_{t3}$	-	-0.050	-1.91**
$LOSS_t$	?	-0.109	-3.47***
$LOSS_t * X_{t3}$	-	-0.303	-3.61***
N			4,730
# of Cross Sections			939
Adj R ²			45.84%

The panel regression model is model (4).

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively (one-tailed tests).

Table 6
Effect of analyst coverage on the informative role of income smoothing after allowing for endogeneity

Variable	Predicted sign	Coefficient	t-statistic
Intercept	?	-1.694	-5.90***
X_{t-1}	-	-0.582	-3.97***
X_t	+	1.404	6.68***
X_{t3}	+	1.046	3.77***
R_{t3}	-	-0.060	-3.73***
$BETA_t$	+	0.017	1.64*
IS_t	?	0.064	0.40
$IS_t * X_{t-1}$	?	-0.558	-1.55*
$IS_t * X_t$	?	1.623	3.88***
$IS_t * X_{t3}$	?	-0.171	-0.38
$IS_t * R_{t3}$	?	-0.054	-1.94**
$ANALYST\_F_t$	?	0.026	5.78***
$ANALYST\_F_t * IS_t$	?	-0.006	-1.09
$ANALYST\_F_t * X_{t3}$	?	-0.042	-3.82***
$ANALYST\_F_t * IS_t * X_{t3}$	+	0.044	2.47***
$BDIND_t$	?	-0.068	-0.45
$BDIND_t * IS_t$	?	0.084	0.38
$BDIND_t * X_{t3}$	?	0.280	0.70
$BDIND_t * IS_t * X_{t3}$	+	-0.517	-0.76
$SIZE_t$	?	-0.000	-10.86***
$SIZE_t * X_{t3}$	+	-0.000	-0.29
BM_t	?	2.024	24.95***
$BM_t * X_{t3}$	+	-0.188	-2.57***
$EARNSTD_t$	?	0.043	3.28***
$EARNSTD_t * X_{t3}$	-	-0.056	-2.16**
$LOSS_t$	?	-0.115	-3.65***
$LOSS_t * X_{t3}$	-	-0.284	-3.39***
N			4,730
# of Cross Sections			939
Adj R ²			45.67%

The panel regression model is model (4), in which *ANALYST* is replaced with the fitted value of *ANALYST* (i.e., *ANALYST_F*) from model (5).

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively (one-tailed tests).

Appendix

Results of the main test without having regression with fixed effects

Variable	Predicted sign	Coefficient	<i>t</i> -statistic
Intercept	?	-0.292	-3.01***
X_{t-1}	-	-0.629	-4.70***
X_t	+	1.197	6.31***
X_{t3}	+	1.006	4.16***
R_{t3}	-	-0.066	-4.55***
$BETA_t$	+	0.031	3.33***
IS_t	?	-0.129	-0.97
$IS_t * X_{t-1}$	?	-0.905	-2.73***
$IS_t * X_t$	?	1.577	4.11***
$IS_t * X_{t3}$	?	-0.113	-0.29
$IS_t * R_{t3}$	?	-0.042	-1.64*
$ANALYST_t$	?	0.001	0.44
$ANALYST_t * IS_t$	?	0.006	1.38*
$ANALYST_t * X_{t3}$	?	-0.030	-3.49***
$ANALYST_t * IS_t * X_{t3}$	+	0.031	2.28***
$BDIND_t$	?	-0.037	-0.30
$BDIND_t * IS_t$	?	0.081	0.42
$BDIND_t * X_{t3}$	?	0.084	0.24
$BDIND_t * IS_t * X_{t3}$	+	-0.193	-0.32
$SIZE_t$	?	-0.000	-6.29***
$SIZE_t * X_{t3}$	+	0.000	3.52***
BM_t	?	0.696	21.01***
$BM_t * X_{t3}$	+	-0.120	-1.86**
$EARNSTD_t$	?	0.034	3.14***
$EARNSTD_t * X_{t3}$	-	-0.105	-4.96***
$LOSS_t$	?	-0.092	-3.20***
$LOSS_t * X_{t3}$	-	-0.413	-5.47***
N			4,730
Adj R ²			26.13%

***, **, and * denote significance at 1%, 5%, and 10% levels, respectively (one-tailed tests).